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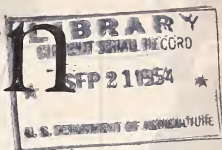


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# Foreign Agriculture



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## FRONT COVER

### U. S. Baby Chicks Go Abroad

At an airport in Connecticut, a shipment of baby chicks is readied for flight abroad. Exporting such perishable goods calls for careful planning.

Last year, 13 million United States baby chicks went to more than 30 countries for flock improvement, breeding, and broiler purposes. (Photo courtesy of Agricultural Company of Pan America.)

## BACK COVER

### Egypt's Cultivated Land Area

Widening the thin ribbon of cultivated land along the Nile figures prominently in Egypt's plans for development.

## NEWS NOTES

### U.S. Farm Exports Up

Exports of United States farm products have been rising in value for several months; in June 1954 they were 6 percent higher than in May and 36 percent higher than in June of the year before. For the past fiscal year as a whole they were valued at \$2,932,000—4 percent more than in 1952-53.

A primary factor in the increase was cotton's large gain in the last half of 1953-54. Stimulated by low foreign stocks and high competitive prices, cotton exports exceeded the level of the preceding year by a substantial margin: 452,000 bales in 1953-54 as against 232,000 bales in 1952-53.

Other major factors were large exports of peanuts, cottonseed oil, linseed oil, and flaxseed. Lard and tallow also showed gains; and a sale of surplus raisins to the United Kingdom brought the total still higher.

Wheat exports, on the other hand, though rising in April and May, did not continue the trend into June. From May to June they fell from 25,000,000 to 20,000,000 bushels; even so, they were 2,000,000 bushels higher than in June 1953.

Corn exports in June were down to 5,000,000 bushels compared to 12,000,000 a year ago. Rice exports were substantially under the preceding year's high levels—47 million pounds compared to 64 million. Tobacco exports in June were seasonally low; orange exports were limited by a small summer orange crop.

Credit for photos is given as follows: pp. 159, 160, Agricultural Company of Pan America; p. 163, Ralph S. Yohe; pp. 166, 167, Norwegian Embassy; pp. 170, 171, Asian Photos.

## FOREIGN AGRICULTURE

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ALICE FRAY NELSON, EDITOR

# U.S. Baby Chicks Go Abroad



by HERBERT W. FORD

In some of the world's most luxurious airliners, millions of baby chicks have left the United States in recent years for the four corners of the earth. Most of these chicks have gone south of the border—to Venezuela, Mexico, Colombia, and Cuba to supply the broiler industries of those countries. Many others have gone to Austria, Egypt, Iran, and Thailand for flock improvement or the establishment of new breeds. In all, United States baby chicks have, over the years, gone to some 40 countries.

The shipping of baby chicks abroad is a flourishing industry built on a high quality product. The United States probably has more well-founded breeds and crosses than any other country in the world: it has over a hundred—the result of half a century of scientific work. Among the most important of the breeds are New Hampshires, White Leghorns, White Rocks, Barred Rocks, and Rhode Island Reds.

By importing baby chicks from the United States, poultrymen of many countries have been able to advance their flocks by 25 years or more in one generation.

To the American farmer, also, constant research on new breeds has meant a great deal, for egg and poultry products provide him with his third largest source of income. Cash receipts to the farmer from such products totaled approximately \$3.8 billion in 1953.

In that year, United States exports of egg and poultry products amounted to \$32 million, 7 percent of which came from trade in baby chicks. This \$32-million total compares to \$1.5 million in 1935—a phenomenal increase in which the export of baby chicks played no small part. In 1935, only a few thousand were shipped abroad; in 1953, 13 million were exported to over 30 countries. More than 90 percent of these baby chicks were for broiler purposes and for crossing to improve native stock and less than 10 percent were for pedigreed breeding stock.

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Most of these chicks—about 10 million—came from hatcheries in Florida and California, although the eggs had been produced throughout the United States. Nearly all of the chicks were shipped from Florida, California, Texas, and New York. Venezuela was our best customer for baby chicks in 1953, taking about 8 million; Mexico ranked second with imports of 3 million; and Colombia, third, with imports of half a million. These chicks were imported primarily for the commercial broiler industries of these countries; however, many were imported for laying-flock replacements. Most of the rest of the chicks sold abroad in 1953 went to Egypt, Iran, and the Philippines for flock improvement purposes.

The successful shipping of 13 million baby chicks abroad in a year calls for skilled technicians and the most modern of methods. Improvements in shipping them are a major concern of airlines and exporters, for both know that a volume business depends on the satisfactory arrival of the perishable cargo.

Just how a shipment of baby chicks is moved



Boxes of baby chicks in a U. S. hatchery are ready for a trip to an airport and a flight abroad. Our foreign trade in baby chicks has become a million-dollar industry in the past few years.

from the hatchery to the buyer abroad is best told by example. An actual order from Austria in 1951 for 200,000 chicks to be delivered in 1952 will serve as that example.

A leading United States exporter of baby chicks spent several months working out the numerous problems attending the shipment. He had to have available enough hatcheries to furnish the chicks when needed. The chicks had to be Pullorum clean. For those that were pedigreed, the exporter had to have official records. He had to acquaint himself with all the regulations affecting the movement of the chicks into Austria and from State to State in the United States. He had to contract for four planes that could be ready to leave at a set time. He had to have built loading racks on which the boxes of baby chicks could be so placed as to allow proper circulation of air.

The actual shipping called for precise timing, for no more than 72 hours can elapse between the time the baby chicks break through their shells and the time they have to be fed. In the 72 hours the exporter had to ensure that the chicks were moved to a certain airport from hatcheries scattered over a number of States, loaded into the planes, flown to Austria, uncrated and fed. All this was actually accomplished in less than 72 hours. If it could not have been, the exporter would have had to ship hatching eggs.

In this way, an average of 1,500 baby chicks per hour are shipped abroad each day from United States hatcheries.

The importance of our trade in baby chicks has been indicated by the fact that last year alone some 30 countries purchased our chicks. Venezuela and Colombia have been purchasing them for both broiler and breeding purposes. Cuba, Jamaica, Mexico, and Panama have been importing them primarily for broilers. Austria, Ecuador, Egypt, Greece, Italy, and Thailand, among others, have been importing them to improve their own flocks. And recently other countries have been indicating an interest in the chicks: Australia, Brazil, Ceylon, Iran, Malayan Federation, Spain, and Yugoslavia.

The hope for new outlets is highly important to the exporters of baby chicks, for they realize that their markets are constantly shifting and that they must promote and seek new ones. They know that because of what happened recently in Panama. Panama has not been self-sufficient in poultry products and has been a good market for our chicks. In



A shipment of hatching eggs arrives in Belgium from the United States. When the journey from U. S. hatchery to buyer abroad takes more than 72 hours, hatching eggs are shipped instead of baby chicks, for the chicks must be fed within 72 hours of their breaking their shells.

1953 we sent them 159,000 and shipments in 1954 will probably be fairly sizeable. But in 1955 our exports of baby chicks to Panama may be drastically reduced because last year national economic self-sufficiency became an integral part of the Panamanian Government's general policy, and certain import controls were enacted to discourage imports of poultry in order to encourage domestic production.

This example is not an isolated one. Other buyers of our baby chicks have developed their own hatching facilities. When they do, they no longer want baby chicks; they want hatching eggs instead. But as domestic egg production increases, local farmers are able to supply the hatching eggs. When this happens, however, there should still be a market for United States breeding stock, since no other country in the world has a greater number of breeds or carries on more extensive breeding research than does the United States.

Therefore, as long as improvements are made in United States poultry, the business of exporting baby chicks should continue to be a flourishing one.



# Egyptian Resources For Economic Development

By GEORGE L. ROBBINS

Much more cotton or wheat will be produced in Egypt if the economic development plans now in the making are carried out. These plans call for the expenditure of large sums of money, much of it in foreign exchange. The question is, Are Egypt's financial assets sufficient to meet the requirements of the development plans now envisaged?

These plans include a proposed long-range program for expanding production and improving transportation and visualize some reorganization of the economic structure of the country. Land reform legislation was enacted during September 1952, shortly after the present revolutionary regime came into power, and a second basic reform was initiated later that year when the Permanent Council of National Production was created. The Council has broad powers to formulate, finance, and implement economic development programs.

In one of its recent moves, approved by the Council of Ministers, it asked international companies to submit bids for a new fertilizer plant. As planned the plant will produce about 370,000 metric tons of nitrogenous fertilizers a year, thereby rounding out the country's needs. Too, it will offer greatly needed off-the-farm employment and provide an outlet for much of the electric power from the Aswan Dam.

The high dam at Aswan is probably the most significant single project proposed, for expanded agriculture in Egypt calls for expanded irrigation. Allegedly, the dam will ultimately increase the arable area by a third. Essentially the project is conceived as a high-level reservoir capable of providing Egypt with about 70 billion cubic meters of water annually plus more power than it has ever dreamed of having.

The need for these plans and projects arises principally from two factors: the dependence of more than three persons upon each acre of cultivated land and the unequal distribution of the income from the land. This situation is further aggravated by a net increase in population of 2 percent annually.

To improve the condition of Egyptians by means

of the programs that are underway or anticipated will require capital expenditures of possibly as much as \$1½ billion over a period of years.

The extent to which this cost can be met by means of a "tighter belt," that is, by further depressing the already low level of living of the people, is a moot question.

If it is assumed that national savings could provide such capital, there remains the problem of foreign exchange because much equipment and material must be imported. Perhaps about a third of the funds required would be needed in the form of foreign exchange. To obtain it, there must be stability and a feeling of confidence in the economy.

Finding the necessary capital and especially the foreign exchange presents a formidable problem.

The base of the Egyptian economy is limited in that the country is highly dependent upon cotton and that probably 85 percent of the population live at a bare subsistence level. Egypt is continually confronted with the problem of whether land shall be used for cereals or cotton. It needs both. It is the major food-deficit country in the Middle East, and it obtains about 80 percent of its foreign exchange earnings from cotton. In addition, most of the population depends upon farming for a living, and cotton provides employment for more people than do alternative crops.

At present the government fixes maximum cotton and minimum wheat acreage quotas. It undoubtedly recognizes that this effort for increased self-sufficiency in food is uneconomic in some respects when cotton and wheat yields average approximately 1 bale and 30 bushels per acre, respectively. The policy might well be interpreted to reflect concern over the expenditure of dollar exchange. At any rate, Egypt's 1953 purchases from the United States—largely of wheat—were five times its sales to the United States.

What is Egypt's economic position? What resources does it have for economic development?

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TABLE 1.—*Balance of payments of Egypt, 1948-53*

(In millions of dollars)

Item	1948	1949	1950	1951	1952	1953
Goods and services:						
Exports, f.o.b.	384.6	408.1	545.8	586.9	427.0	395.1
Imports, c.i.f.	-431.6	-425.6	-599.5	-671.0	-597.3	-478.3
Trade balance	-47.0	-17.5	-53.7	-84.1	-170.5	-83.2
Suez Canal dues	52.8	66.0	75.2	75.8	76.3	83.5
Nonmonetary gold and investment income	-45.1	-59.1	-71.5	-63.4	-48.2	-31.6
Other	-3	20.1	20.1	24.7	-10.9	8.6
Total goods and services	-39.6	9.5	-29.9	-47.1	-153.3	-22.7
Private capital:						
Net errors and omissions	-32.2	-7.5	-6.3	-8.9	-3.4	-4.9
	11.2	1.2	4.6		-1.7	-9
Cumulative total	-60.6	3.2	-31.6	-56.0	-158.4	-28.5

Note: These data have been arbitrarily converted from rounded Egyptian pounds at the current official rate of 2.87 U. S. dollars per pound. While this reflects relative changes from year to year, it ignores the revaluation of the Egyptian pound from about \$4.13 on September 18, 1949.

Source: Compiled from published data of the International Monetary Fund.

Each year since 1939, Egypt has imported more than it has exported. True, in 1953, a realistic trade policy enabled the country to reverse the increasing trade-deficit trend. Still, the 1953 deficit is significantly exceeded only by that of 1952.

Before imports and exports can be brought into balance, it appears that productivity will have to be increased, particularly since at least 40 percent of the government revenues have, for a number of years, been derived from customs receipts. This dependence upon customs duties tends to perpetuate a high volume of imports. More revenue from direct taxation cannot be had until national income is higher, for the margin between goods produced and domestic requirements is too narrow. Therefore, a balanced internal budget and a balance in trade do not appear to be simultaneously attainable for some time.

Income from the Suez Canal contributes about \$75 million a year toward Egyptian balance of payments. That income approximately offsets the average trade deficit of 1948-52. During each of these years, however, there was a net withdrawal of nonmonetary gold, investment income, and private capital, which, combined, average almost as much as the trade deficit.

Therefore, official financing has been necessary to balance a cumulative payments deficit in most recent years. At the same time, Egypt has been trying to redirect its trade: To import from those countries to which it can sell, and thus avoid using its foreign reserves.

The trade imbalance has been cutting Egypt's

TABLE 2.—*Gold and foreign assets of Egypt, 1949-53<sup>1</sup>*

(In millions of dollars)

Item	1949	1950	1951	1952	1953
National Bank:					
Gold	984	979	957	752	728
Foreign exchange	54	98	174	174	174
Foreign investments	694	836	356	209	214
Other banks foreign exchange	236	245	427	369	340
Total	32	24	20	26	23 (Nov.)
Dollar exchange in U.S. banks	1,016	1,003	977	778	748 (Nov.)
Free sterling	62	76	110	60	37 (mid-Dec.)
	183	150	68	18	47

<sup>1</sup> At end of year.

<sup>2</sup> The large decline in foreign exchange and increase in foreign investments between 1950 and 1951 reflects a shift of blocked sterling from U.K. treasury bills to U.K. long-term securities.

total gold and foreign assets; at the end of 1950 they were an equivalent of \$1,002 million but by November 1953 they had dropped to \$748 million. The fall in foreign assets is more impressive when it is recognized that over 60 percent is blocked sterling, which by agreement is released at the rate of only about \$29 million a year. In the decline, the free sterling account was nearly exhausted, and advances were obtained from blocked sterling. Still, these funds were not sufficient to meet Egypt's international payments in 1952.

National income in Egypt is now some 15 percent lower than it was 3 years ago. During 1950 and 1951, inflationary forces were dominant and Egypt's trade in cotton was brisk, owing largely to strong world demand. But, in 1952, exports shrank much more than imports and credit tightened. Business stagnation appeared when the government abandoned the policy of high price support for cotton, and signs of a recession developed. Purchasing power continued to fall during 1953, and many prices were decontrolled.

Hopes for the future, as presented by the government, have probably offset reactions of the majority of the population to lower purchasing power. The smaller group—business and professional men, large landowners, and the more educated, who do not base attitudes so exclusively upon prices received for crops and paid for necessities as does the average Egyptian—is much more concerned about the present recession. People in this group are also more skeptical about the proposed economic development program. Since the attraction of private domestic capital is dependent upon the attitude of this relatively small group, Egypt's task of economic development is even more formidable.

The need for large-scale economic development



to step up national income and the rate of growth in production is readily apparent, but how it can be attained within available economic and financial resources is not so clear. The attainment of trade equilibrium in the near future is at best doubtful, barring an unforeseen increase in canal revenues. But the attainment of such an equilibrium seems essential to the stabilization of foreign assets. The continued use for consumption requirements of more foreign exchange than is currently earned would appear to limit future opportunities for the government to finance abroad a large amount of new capital investment for use in the next several years. This would appear to be so irrespective of historic budget data and prospects for increasing taxes, which currently amount to about one-fifth of national income.

Private capital resources in Egypt are fairly substantial, but total private savings have been estimated at less than \$200 million annually, and the margin available for increasing the rate of investment is negligible. This savings figure includes business savings, with which industrial development has been financed. When these savings are deducted

from total savings, a possible maximum of \$140 million to \$150 million of annual private savings remains. This is about the amount envisaged as required each year for a decade for economic development necessary to cope with the population problem. However, only a small part of personal savings has normally been available for reinvestment; in other words, a large part has traditionally gone into real estate and very substantial amounts into gold and currency. The diversion of these funds from land and hoarding will require both confidence in the economy and a time-consuming educational program. It should be added that hoarded funds have always been used in emergencies; consequently, little if any net savings accumulate in these hoards.

The problems Egypt faces in balancing its internal budget and simultaneously attaining a balance in trade, the country's business conditions, the attitude of the professional and business people, and the private savings available for reinvestment—all these strongly suggest that Egypt's financial assets may not be sufficient to meet the requirements of the extensive development program now envisaged.



Nearly three-quarters of Egypt's people live in mud villages much like this one, clustered along the irrigation ditches that carry water for them, their animals, and their fields. Egypt's resources for economic development are limited by the poverty of this large segment of the population.

# Agricultural Trade Development And Assistance Act of 1954

Determination of the United States to expand its agricultural exports is reflected in Public Law 480, the "Agricultural Trade Development and Assistance Act of 1954" enacted by the 83rd Congress.

To increase the consumption of United States agricultural commodities in foreign countries and to improve the foreign relations of the United States are listed as principal objectives.

Specific aims of the legislation are cited as follows:

"It is hereby declared to be the policy of Congress to expand international trade among the United States and friendly nations, to facilitate the convertibility of currency, to promote the economic stability of American agriculture and the national welfare, to make maximum efficient use of surplus agricultural commodities in furtherance of the foreign policy of the United States, and to stimulate and facilitate the expansion of foreign trade in agricultural commodities produced in the United States by providing a means whereby surplus agricultural commodities in excess of the usual marketings of such commodities may be sold through private trade channels, and foreign currencies accepted in payment therefor. It is further the policy to use foreign currencies which accrue to the United States under this Act to expand international trade, to encourage economic development, to purchase strategic materials, to pay United States obligations abroad, to promote collective strength, and to foster in other ways the foreign policy of the United States."

The Act authorizes use of Commodity Credit Corporation funds up to \$1 billion, over a period of 3 years, in carrying out its objectives.

Title I—Sales for Foreign Currencies—provides for the use of up to \$700 million in carrying out a program for the sale for foreign currencies of surplus agricultural commodities, under agreements with friendly nations or organizations of friendly countries.

In making such sales, care is to be exercised that

usual marketings of the United States are safeguarded, that world prices are not unduly disrupted, and that private trade channels are used as much as practicable.

The foreign currencies that accrue may be used for such purposes as:

- (1) development of new markets for United States agricultural commodities;
- (2) purchase of strategic and critical materials, to establish a stockpile additional and supplemental to the quantities acquired under the Strategic and Critical Materials Stockpile Act;
- (3) procurement of military equipment and defense materials, facilities, and services;
- (4) financing the purchase of goods or services for friendly countries;
- (5) promotion of international economic development and trade;
- (6) payment of United States obligations abroad;
- (7) loans to promote multilateral trade and economic development;
- (8) financing international educational exchange activities.

Title II—Famine Relief and Other Assistance—provides that surplus agricultural commodities, not to exceed \$300 million in value, may be transferred from Commodity Credit Corporation to friendly nations and friendly populations in order to meet famine or other relief requirements. Such transfers may be made on a grant basis to assist friendly countries or voluntary foreign relief agencies.

Title III—General Provisions—further facilitates distribution of surplus commodities for relief purposes, including distribution in domestic disaster or labor-distress areas, to the Bureau of Indian Affairs, to school lunch programs, and to public and private agencies for the assistance of needy persons.

Title III also provides for the barter or exchange of agricultural surpluses in return for certain materials from foreign countries, including strategic materials.

# Agricultural Attachés Transferred to USDA

The agricultural attaché system has been returned to the United States Department of Agriculture as one of the provisions of the Agricultural Act of 1954.

The attachés, reporting directly to the Department of Agriculture, now will devote their full time to representing United States agriculture abroad. In signing the Act, the President stated that the attachés were being shifted from the Department of State to the Department of Agriculture "in order to sharpen the effort to find new world markets for our agricultural products."

In addition to aiding in maintaining and increasing exports of United States agricultural commodities, they will continue to have a major function of obtaining information on foreign market conditions for United States farmers and agricultural trade groups.

The agricultural attachés were first established in the Department of Agriculture by an Act of Congress in 1930, but were transferred to the Department of State by executive order in 1939. Since that time, though Department of Agriculture officials have participated in the selection and placement of the attachés, they have not been in position to direct attaché activities. The Agricultural Act of 1954 returns the attachés to a position of direct service to American agriculture.

The attachés are expected to assist in moving commodities into export by working with foreign governments with respect to barriers to the movement of agricultural commodities; by bringing together importers in foreign countries and exporters from the United States under conditions favorable to trade; and by keeping in close touch with the reception of United States products by foreign consumers, and suggesting improvements that may lead to increasing preference for and larger consumption of American farm commodities.

The attachés also will make regular and special reports as to marketing situations abroad and foreign production of agricultural commodities that may compete with those of the United States. Such information will help to enable American agricul-

ture to make necessary adjustments, both in its production and in its marketing, to meet changing situations. The information also will enable exporters to determine areas in which they may be able to develop markets and to provide background data essential to such development.

The new Agricultural Act authorizes the Secretary of Agriculture not only to assign attachés abroad for tours of duty, but also to transfer them back again to serve within the Department. By having complete interchangeability between Department employees overseas and those in the United States, it is felt that the job of both can be done more effectively.

The attachés, in general, will continue to be stationed at the United States embassies as a part of the official United States family abroad. Activities will be carried on in coordination with those of other United States representatives under the leadership of chiefs of United States diplomatic missions.

Funds appropriated for the current calendar year will permit little, if any, increase in the number of attachés at this time. But it is expected that the new arrangement will improve the effectiveness of the agricultural attaché system immediately by (1) providing more adequate funds for local travel whereby attachés may more effectively perform their responsibilities in the country assigned, (2) providing more adequate stenographic help, and (3) enabling attachés and their assistants to spend full time on agricultural activities.

There are now 59 agricultural attachés assigned to 44 posts in 42 countries: Argentina, Australia, Austria, Belgium, Brazil (2 posts), Burma, Canada, Chile, Colombia, Cuba, Denmark, Egypt, El Salvador, France, Germany, England, Greece, Guatemala, India (2 posts), Indonesia, Iran, Ireland, Italy, Japan, Malaya, Mexico, Netherlands, New Zealand, Pakistan, Panama, Peru, Philippines, Russia, Spain, Syria, Sweden, Thailand, Turkey, Union of South Africa, Uruguay, Venezuela, and Yugoslavia.



## Labor Shortage Speeds Mechanization Of Norwegian Farming

By ANDREW MOURSUND

Norwegian farmers, faced with a growing shortage of labor, are rapidly turning to tractors and combines. Today, they have some 22,000 tractors and well over 2,000 combines; in 1945, they owned only about 4,000 tractors. In the years since the war, approximately 120,000 farm workers have left the land to seek employment in industry, and more are leaving every month.

At the end of World War II, just before the "tractorization" of agriculture got under way in earnest, farmers owned a total of 208,000 horses. By 1953 the number of horses had dropped to about 168,000, at the rate of 5,000-6,000 fewer horses each year. Despite these developments, however, tractors are not likely to replace horses altogether on Norwegian farms; much of the farmland is too hilly for tractor operation, and, for thousands of farmers owning only a few acres of arable land,

the cost of acquiring a tractor is prohibitive. The drop in horses has been most notable on farms of 50 acres and more, while on those of smaller size the number of horses has actually increased.

Farmers in Norway are predominantly smallholders. More than 92 percent of the 350,000 farms listed in the 1949 agricultural census consisted of less than 25 acres of arable land, and only 37 farms in the whole country comprised 250 acres or more. But most farmers also own forest tracts and many farmers own natural meadows (which they use for haymaking) and, in certain regions, large mountain pastures (where they graze their herds in the summertime). In the coastal areas farming is frequently combined with fishing, while

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farmers in the interior supplement their earnings with lumbering, handicraft, and fur farming. Nearly all Norwegian farmers own the land they operate. Thus, in 1949, 91 percent of the total were listed as proprietors, while the remaining 9 percent were leaseholders.

On the many small farms of Norway the labor shortage has not been so keenly felt, of course, as on the large farms; nevertheless, some of the work on small farms is often done by machines now, too, generally from agricultural machine stations.

These stations are benefiting an increasing number of smallholders. It has been estimated that a smallholder operating about 8 acres needs at least one horse to do the work, but about a third of the crop goes to feed the horse. However, by joining a cooperative station or utilizing the services of a commercial station, a smallholder can sell his horse and have the use of a tractor with implements which can do the work of seven horses. The cost is more than made up by higher productivity and greater efficiency.

The agricultural machine stations and the large farmers have taken most of the 180,000 tractors imported into Norway since the war.

In 1946, the Norwegian Parliament amended the law of 1936 under which the Operating Credit Agency for Agriculture was functioning, to permit this agency to extend direct and indirect loans to two types of machine stations and to give subsidies for the purchase of agricultural equipment. The machine stations may be organized either as (1) cooperative societies, in which the machines are owned jointly by members, or as (2) machine holders, in which the machines are owned by individuals who contract with farmers to do their work at a fixed rate.

Each member of a cooperative machine purchasing society may be granted a loan corresponding to the portion of the purchase expenses assigned to him within the cooperative. The cooperative machine station may borrow up to 70 percent of the purchase price of the machines and receive a subsidy up to 30 percent of the purchase price.

Before a 30-percent subsidy is granted, the area of operation for both the cooperative station and the sole ownership type must be approved by the local agricultural council. All farmers within each area have the right to become members of the cooperative station or to hire the services of an individually owned station.



Tractors have been doing more and more of the work on Norwegian farms since the end of the war but are not likely to replace horses entirely on the many small and hilly farms of the country.

An individual wishing to become a machine holder may borrow either from a cooperative credit association or directly from the farm credit agency. A loan from a cooperative credit association may cover up to 75 percent of the purchase price. In the case of a loan from the credit agency the maximum is 70 percent of the purchase price, with the proviso that the individual invest at least 5 percent of his own capital. The amount of subsidy depends upon the area of arable land to be worked.

The loan and subsidy policy, coupled with the improved financial position of farmers and the shortage of farm workers, has greatly stimulated the establishment of machine stations. There are now about 2,600 compared with only 55 in 1946.

All machine stations operate under the guidance and supervision of the credit agency. Free advice on selection of machinery and implements is furnished by the Institute of Agricultural Engineering, and advice on management and crop planning may be received from the Institute of Agricultural Economics. The latter is now analyzing and drafting basic proposals for farm operation in two selected districts, in cooperation with local organizations, and gives courses in handling and maintaining farm machinery for 500-600 youths every year. —Reprinted from *News of Norway*, June 3, 1954.



# Milk for Bombay's Millions

By ERIC B. SHEARER

About 20 miles north of the city of Bombay, just beyond the narrow salt-water channel that separates Bombay island from the mainland, is the biggest dairy farm in the world.

It covers 3,500 acres and in its 26 modern barns, set in fields of grass, 12,500 milking animals are sheltered. On its highest hill is the central milk plant and, a little further downhill, the beautifully landscaped observation pavilion that is a favorite of Bombay's Sunday crowds. Few things remind one—particularly during the long dry season, when the land all around is parched and desolate—that this is Western India. The animals do, of course; they are the large, black water buffaloes that furnish more than one-half of the milk in a country where bovine animals are generally used for work.

These water buffaloes, plus an equal number scattered through 60 upstate villages—and some imported powdered skim milk—today furnish about 33,000 gallons of wholesome, pasteurized milk daily to nearly one-third of Bombay's population of 3½ million; this is about 50 percent of the milk sold in the city.

There is no surplus-milk-producing area within about 300 miles of the city of Bombay. Thus, until 5 years ago, Bombay's milk supply, like that of most Indian cities, came from buffalo herds stabled in the city; it was distributed raw and without any sanitary control worthy of the name. Under filthy conditions and at great cost, 15,000 buffaloes were being kept within the city limits and more than 50,000 in Greater Bombay.

The practice was to import cows in calf from northern India and to keep them penned up in the city for one lactation, at the end of which they were generally sold for about one-fifth of the purchase price. Feed and fodder had to be brought into the city, of course. These expensive practices—plus the acute imbalance between supply and demand caused by the rapid growth of the population—had brought the price of the unsanitary buffalo milk to the equivalent of nearly 20 U. S. cents per quart, in a city where 80 percent of the families earn less than \$40 a month.

And it is obvious what the keeping of 15,000 buffaloes within the city limits meant to those who lived near the stables and what problems were created for health authorities. Moreover, the system left little if any room for an expansion of milk production and consumption.

Nevertheless, nothing was done to improve Bombay's milk supply until wartime problems of rising prices and the virtual cutoff of buffalo "imports" forced the authorities to adopt a "subsidized milk scheme" in 1944. Under this program the city collected milk from producers and sold it to ration-

card holders at about half of the prevailing retail price.

In 1947 the newly elected independent State Government decided to abandon the subsidy program, but the decision met with strong popular disapproval. At that time, a handful of progressive and imaginative public servants—encouraged by State Minister (then, for Civil Supplies) Dinkarrao Desai—saw an opportunity to translate into action what they had been planning for 2 years.

The origin of their plan had been the purchase by the State of an entire village—Aarey, 1,100 acres of near-jungle land—in November 1945, with the general objective of starting a Government dairy farm on the pattern of India's numerous military farms. Here, 1,000 buffaloes were to be kept, to provide 10,000 pounds of additional milk daily to Bombay.

But the Minister, as well as the then Provincial Milk Commissioner, Mr. M. D. Bhat, and his deputy, D. N. Khurody (both appointed in 1945) succeeded in convincing the Provincial Government, in early 1946, that such a project would be too limited in scope. Thus, it was decided to embark upon a scheme that only 8 years ago "appeared to be too revolutionary and not immediately capable of implementation" to its most enthusiastic protagonist.

The objective of the scheme was twofold: to create a safe and steady milk supply and to remove the buffaloes from the city. Today, the plan sounds logical and simple, but at the time there was much opposition and a host of technical difficulties.

Actual construction on the Aarey Milk Colony began in January 1948, and the first farm unit was completed and occupied in March of the following year; the inauguration ceremony was performed by the President of India. But, so strong is the force of tradition that, at first, only three cattle owners voluntarily shifted their stock from the city to the colony. Finally, when enough barns had been constructed, the Bombay Municipality issued an ordinance forbidding the keeping of cattle within the city limits, and, by the end of 1949, after the State Supreme Court had turned down a request from a buffalo owner for an injunction against this order, owners began to drift into the colony in large numbers. By this time, 2,400 acres of land had been added to the colony.

For about a year after that, the milk distributed

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by the colony was raw, but it was much cleaner and of better quality than the milk that had come from the herds in the city. (Also, until September 1953, some milk was purchased on the outside.) Meantime, a modern pasteurizing plant was going up in the middle of the colony, and technicians were being trained on the spot with the help of the foreign experts who were supervising the setting-up. On December 15, 1950, a trial run of the plant was made, and on March 4, 1951, Prime Minister Nehru formally opened it. Since then, it has been in full operation.

The plant—and the other buildings and the land of the colony—is the property of the State, and the milk is sold by the State, but the animals are owned by the same individuals who owned them in the city. The only obligation imposed upon the “licensees” is that all the milk except a certain allowance for personal consumption and calf feeding must be sold to the colony’s central plant. The colony, in return, provides shelter for the animals and housing for the owners and attendants, veterinary services, and sanitary supervision, as well as technical assistance in breeding and feeding, at a flat monthly rate of 13 rupees (less than \$3) per buffalo. The price paid to producers for their milk is calculated to give them a gross return of 10 percent on their investment; continuous cost accounting keeps the price up to date. Currently it is 13½ annas per seer, or 8½ U. S. cents per pound, for milk containing about 7 percent butterfat. The cattle owners are also entitled (though not obligated) to purchase green fodder, hay, and concentrates from the colony, the cost of which is deducted from their milk checks.

Each of the 26 barns of the colony houses about 500 buffaloes, as well as their owners and attendants. Each unit has a screened-in milkhous where the milk from individual animals can be weighed and recorded. The buffaloes are hand milked twice a day into covered milking pails. The floors and gutters of the buildings are frequently swept and hosed, and the buffaloes are washed every day (and clipped once a year).

Average daily milk production per milking buffalo in 1953-54 was around 14 pounds (over 30 percent more than in 1949-50). This output is equivalent to 300 pounds of butterfat per year, since the milk tests about 7.2 percent (average butterfat production per cow in the United States is about 210 pounds). The record producers yielded about 10,000 pounds of milk, over 700 pounds of butterfat in a year.

The average one-owner herd consists of about 150 cows; the smallest, of 4; the largest, of 1,500 (spread over three units). This means, then, that several herds generally share a unit. Responsibility for cattle management rests entirely with the licensees; resident supervisors of the colony, one for every two units, exercise general supervision only.

But effort is being made to change the tradition-

al practices of the buffalo owners, and some progress is being made with the able and understanding assistance of Ian MacRae, an “old India hand” from Scotland, sent out here by Food and Agriculture Organization of the United Nations (FAO) in November.

Now, for instance, cows are being kept, on the average, for three lactations, rather than being sold off as soon as they go dry the first time. The dry cows are sent to a 4,000-acre farm that the colony maintains upstate for “salvaging” animals; 1,000 cows can be kept there at one time—about 3,000 per year.

Efforts at upbreeding the herds have been very slow to take hold. It is not the habit of the local husbandman to save calves, the birth of which is considered a necessary but unwelcome phenomenon incidental to milk production. Nor does he generally add to his income by selling the calves to a butcher, though he thinks nothing of letting them starve to death. His reluctance to sell calves is only vaguely founded on religious doctrine, since buffaloes are not considered sacred.

Seven buffalo bulls owned by the colony are available to the herds through artificial insemination. Yet, though many licensees take advantage of this service, at this time only about 30 animals out of the thousands in the milking herds were bred and reared in the colony. However, many “home-bred” young stock are now being raised at Aarey and at Palghar (the dry cow farm), and recently an entire unit at the colony was reserved for raising calves; they will be bought from the licensees with the aid of a Union Ministry of Agriculture subsidy.

Even now, however, upbreeding will not move along quickly. For one thing, it takes 4 years for a buffalo calf to become a milk producer. Too, breeding must practically start from scratch, because there are no pedigrees and buffalo bulls are not progeny tested. Thus, until such time as Aarey develops its own selected strain, buffalo cows and bulls will continue to be judged primarily on physical characteristics. To make matters worse, the largest single source of the best producers, Lahore in Pakistan, is still practically closed to India.

The average recommended ration for the cows in milk is 12 pounds of green grass, 18 pounds of dry fodder, and 12 pounds of concentrate. The concentrate consists of soaked whole cottonseed, wheat bran, several kinds of oilcakes, and pulse flours.

Daily consumption in the colony is 80 tons of green fodder, 90 tons of hay, 70 tons of concentrate (feeds represent nearly one-half the total cost of production).

All the green fodder used is grown by the colony, which keeps a total of 300 acres of land in Para grass throughout the year and harvests an average of 75 tons of green fodder per acre. This land is irrigated, for almost all the rain in the area—

about 30 inches a year—falls in the winter. Irrigation water is guaranteed by the Bombay Municipality from a nearby reservoir. Plant nutrients are supplied by the plentiful manure and by mixing barnyard liquids with the irrigation water; the highest yields are obtained from one 20-acre field that is irrigated with the waste waters from the pasteurizing plant.

The two-story pasteurizing plant is built and equipped according to the most modern standards; it is just like any well-run plant anywhere else in the world, with equipment for handling milk, doing everything from weighing in the raw milk to putting aluminum caps on the bottles. What is exceptional about it is that it is reputedly the only plant of its size in Africa and Asia; it makes Bombay unique in that part of the world, for no other city between Suez and Singapore has access to a safe and steady supply of pasteurized milk.<sup>1</sup> Set up to process up to 5,000 U. S. gallons of milk per hour, the plant currently turns out only about 33,000 gallons of bottled milk every 24 hours, owing to the limited supply of raw milk.

Actually, the milk supplied by the colony's own buffaloes is supplemented daily by about 10,000 gallons shipped in cans by train from Anand, 266 miles away, where it is collected by a villagers' cooperative and pre-pasteurized. Icing of the specially built, insulated cars assures a maximum milk temperature of 50° F. upon receipt at the plant 12 hours later. In addition, the supply of the colony is stretched by standardizing a part of the whole buffalo milk down to a 3.5 percent fat content (but maintaining 9 percent nonfat solids) through the addition of reconstituted nonfat dry milk solids. About 8,000 gallons of this product, called toned milk, are distributed daily. It is consumed principally by children and invalids who are unable to digest the rich, whole buffalo milk and by low-income families.

A fleet of 105 trucks carries the milk from the colony to Bombay city twice a day and brings back the empty bottles. The milk is sold through nearly 700 stands, by salaried distributors, from 6 a.m. to 7 a.m. and from 2 p.m. to 3 p.m. because there are no food shops with refrigeration facilities. The colony does not manufacture dairy products and thus has no outlet for unsold milk returned to the plant. Therefore, it must plan its volume of output. To help it do so, consumers must obtain from the Milk Commissioner's office a "ration card" stating their daily requirements. There is at present no limitation on the number of card holders; low purchasing power is holding down demand. Only about 1 million people in a city of 3½ million buy their milk from the colony, and many of them share a small bottle.

<sup>1</sup> Some of India's 30-odd military farms, which provide milk and meat for army posts, have small pasteurizing units.

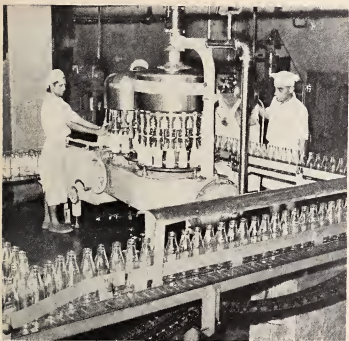


Just 5 years ago, milk for Bombay came from buffaloes housed in filthy stables in the city, with their attendants' "homes" on cots above them, and was delivered raw and in bulk. Today, it comes from the same buffaloes, now housed in clean modern buildings at Aarey Milk Colony, and is pasteurized and bottled in the colony's own plant.

Aarey milk is sold at 14 annas (18½ cents) per quart of whole (7.2 percent) milk. Toned milk costs 8 annas (10 cents).

The capital investment in land, buildings, and equipment that the colony represents is in the neighborhood of \$6 million. With a gross turnover of \$10 million a year, the scheme, which employs 3,500 (of whom 1,400 are part-time distributors), is currently running an operating deficit of about \$200,000. This deficit, however, is turned into a profit, which is used for further capital investment, through the sale of imported powdered skim milk to Bombay hotels and restaurants. These institutions are by law forbidden to serve whole milk with coffee and tea, and the State of Bombay has appointed itself as the exclusive agent for milk powder. A total of 2,400 tons a year are imported (mostly from Australia and New Zealand), of which about 300 are used for toning. No American milk powder has been bought since 1946, mainly because United States prices have not been sufficiently competitive.

Looking at the operation today, Milk Commissioner D. N. Khurody says "there is no reason why this couldn't have been done thirty years ago."



Actually, Khurody is doing himself an injustice with such a remark. This 48-year-old Union Ministry of Agriculture official has been the project's chief promoter. One of India's authorities on agricultural marketing, he has been "on loan" to the Bombay Government for nearly 10 years. He is the first graduate of India's Institute of Dairy Technology at Bangalore. Before he took his present job, he had been abroad only once. Since then, however, he has visited many European countries, and this year he spent 2 weeks in Colombo, Ceylon, advising that Government on its milk supply prob-

lems, and next year he plans an extended trip to Australia and New Zealand. He also expects to play host to an FAO-sponsored international graduate course in tropical dairying in November.

Every technician in the colony is Indian, and most of them received their specialized training on the farm. Recently a second adviser from FAO joined Ian MacRae at the colony; he is Svend Sorensen, a dairy technologist from Denmark, who arrived in the summer of 1953.

The success of the Bombay project does not blind its creators to the large, vital problems that remain to be faced. They are well aware of the overall objectives of future planning: (1) expansion of the milk supply and removal of all cattle from the suburbs of Bombay, and (2) drastic cuts in the cost of production, in order to eliminate the current operating deficit and bring the retail price down to a level conducive to increased consumption among low-income groups.

Problem No. 1 is approaching some measure of solution. Surveys are already being made to find a suitable site for a second Aarey-like colony. Moreover, village milk production in the Anand area is expected to increase in 1955 or 1956, as soon as a small milk-drying plant, to be financed by the United Nations Children's Fund, goes into operation. This plant will siphon off surplus milk in the flush season, during which milk output is doubled, and thus encourage villagers to raise more buffaloes.

Problem No. 2 requires a painstaking reappraisal of the entire operation, particularly of breeding and feeding practices. While the traditional impediments to such progress are admittedly considerable, workers at the Aarey Colony would appear to have a great initial advantage in this field over the average rural extension worker, in view of the centralized management and technical services of the colony and of the administrative pressure that can be brought to bear on the licensees. Too, there seems to be ample scope for expanding feed and other crop production on the colony's 3,500 acres, though terracing of the hillsides and the introduction of overhead irrigation may be necessary. Such expansion would also make possible the utilization of the plentiful manure, a good part of which is being wasted today.

The Bombay experience is encouraging other Indian cities to combine private ownership with municipal responsibility to plan for a better milk supply. In Bombay State, both Poona, the erstwhile summer capital, and industrial Ahmedabad have requested State assistance for milk projects. India's largest city, Calcutta, and its capital, New Delhi, are also about to engage in schemes of their own. The second 5-year plan is expected to provide for considerable Government encouragement to milk projects.



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